

Printed Pages : 2



EEC-403

(Following Paper ID and Roll No. to be filled in your Answer Book)

**PAPER ID : 131403**

Roll No.

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**B. Tech.**

(SEM. IV) THEORY EXAMINATION, 2014-15  
**ELECTRONIC INSTRUMENTATION AND  
 MEASUREMENTS**

Time : 3 Hours]

[Total Marks : 100

- Note :
- (1) Attempt rill questions .
  - (2) All questions carry equal marks.

- 1 Attempt any four parts of the following : **5×4=20**
- a) Determine the dimensions of Magnetic Flux density, Electric field Strength. Explain the absolute error and Gross error.
  - b) Current was measured during a test as 30.4A, flowing in a resistor of  $0.105\ \Omega$  It was discovered later that the ammeter reading was low by 1.2 percent and the marked resistance was high by 0.3 percent, Find the true power as a percentage of the power that was originally calculated.
  - c) Explain the construction and working of Galvanometer.
  - d) What is the effect' of temperature change in Ammeter and Voltmeter? How can we minimize the temperature effect in Ammeter and Voltmeter?

- e) A PMMC instrument has a three resistor ayrton shunt connected across it to make an ammeter. The resistance values are  $0.05\ \Omega$ ,  $0.45\ \Omega$  and  $4.5\ \Omega$ . The meter resistance is  $1\ \text{K}\ \Omega$  and FSD is  $50\ \mu\text{A}$ . Calculate the three ranges of ammeter.
- f) How can we measure unknown resistance using Series Ohmmeter?
- 2** Attempt any four parts of the following :  **$5 \times 4 = 20$**
- a) Draw and explain the circuit diagram of Voltage to current converter with full wave rectifier AC electronic Voltmeters.
- b) Explain the working of FET Input Voltmeter with its circuit diagram.
- c) Draw and explain the block diagram of the Ramp Type DVM with its system waveform.
- d) What are the two methods of measuring current using high current probes of multimeter?
- e) Compare Digital and Analog Multimeter. Explain the concept of Burden Voltage.
- f) A digital frequency meter has a time base derived from  $2\text{MHz}$  clock generator frequency divided by decade counters. Determine the measured frequency when  $3.524\ \text{kHz}$  sine wave is applied and when the time bases uses i) Six - decade counters ii) four decade counters.
- 3** Attempt any two parts of the following :  **$10 \times 2 = 20$**
- a) Explain the working of Q-meter. What is the measuring procedure for high impedance measurement in Q-meter?
- b) Explain the Kelvin Bridge for unknown resistance measurement method. A wheat stone bridge has

$P = 3.5K\Omega$ ,  $Q = 7K\Omega$  and  $S = 4K\Omega$  when  $R = 2K\Omega$ . Resistors are arranged in such a way that the bridge is in balanced condition. The supply voltage is 10V and galvanometer has a current sensitivity of  $1\mu A/mm$  and its resistance is  $2.5K\Omega$ . Calculate the minimum change in  $R$  which is detectable by the bridge.

- c) Write short note on :
- i. Series resistance Capacitance Bridge also draws its phasor diagram.
  - ii. Hay Inductance Bridge and its application.
- 4 Attempt any two parts of the following : **10×2=20**
- a) Draw the block diagram of automatic time base of oscilloscope. Show the waveforms and explain its operation.
  - b) write a short note on
    - i) DSO operation
    - ii) 1:1 oscilloscope probes.
  - c) Draw and explain the block diagram of Delayed- time-base (DTB) system, Show the system waveforms.
- 5 Attempt any two parts of the following : **10×2=20**
- a) Draw and explain the circuits for calibration of d.c. voltmeter and wattmeter with standard instruments.
  - b) Describe with the help of block diagram the operation of X-Y recorder. Also list the application of X-Y recorder.
  - c) Write a short note on
    - i. Galvanometric strip chart recorders
    - ii. Plotters.